The determinants of box office revenue: a case based study: thirty, low budget, highest ROI films vs. thirty, big budget, highest grossing Hollywood films

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THE DETERMINANTS OF BOX OFFICE REVENUE:

A CASE BASED STUDY

Thirty, Low Budget, highest ROI Films

Vs.

Thirty, Big Budget, Highest Grossing Hollywood Films

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Date de soutenance : 10 June 2013

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I. Abstract

This paper investigates the determinants of box office revenue in motion picture industry on a case base study. Thirty highest grossing low budget ROI movies, are compared with thirty highest grossing Hollywood - high budget movies made in the history of cinema. It is believed that the characteristics due to the budget difference between these two samples affect the way their financial success path is driven. While the descriptive data is evidently showing us some clear facts and overlaps with the literature and our expectation, the simple regression part show only two variable the budget and release date are in a significant positive correlation with box office revenue, the other ten determinants found to be insignificant.

II. Introduction and Motivation

The motion picture industry is characterized by a very high degree of ex ante uncertainty. Most movies are financially unsuccessful only few succeeds a hit (De Vany, 2005). The reason behind is that movies are experience goods one can't be sure about the success before it's released. The majority of the films released each year fail to make money. On average 7 out of 10 films end up with failure and loss. Only 2 of them catch the breakeven point. And only 1 out of ten movie makes profit or become successful. (Vogel, 1998). Hence there is no question that financial risk is the primary characteristic of the motion picture industry, the demand is impossible to predict and nearly all costs are incurred before. However the industry still survives, only a small percentage of the films bring big box office performances and once it is over looked to the industry it still makes profit overall due to this upper tail successful movies. Given this highly risky nature of profit in the film industry, cinematic success is studied widely to understand the nature of the industry and to be able to propose a solid formula which leads to a financial success. On the other hand, what one means by success? According to Velovsky a movie is successful if it collects minimum %373 return to it's budget, investment(Velovsky, 2013). However success is a multiple dimensional phenomenon. There exists three main criteria by which a film's success is evaluated: critical acclaim, financial performance, and movie awards (Simonton, Dean Keith, 2004).

This paper is a case based study focusing on two different selected clusters. The first group is formed by 30 carefully selected movies which hold the highest rate of return to their budget in the history of cinema. Throughout the paper this sample will be called ROI (rate of return) movie sample. Statistically the most known ROI films are all small budget films and mostly independent films. What's an indie (independent) film? Indie movie is a low budget (5 to 25 million) film made outside the studio system. An independent film represents the filmmaker's vision untouched by studio executives. However within our ROI film sample we have independent movies as well as few films shot under studio management. Hence not all the movies in ROI sample are independent yet all 30 of them have budgets under $15 billion and brought extreme high box office revenue success, which is the common point of our ROI film sample.

The second group is formed by another 30 carefully selected Hollywood movies. All the movies within the second sample which will be called Hollywood sample are high budget movies brought high world wide box office revenue. The difference between two clusters is evidently the budget difference and the similarity is the two clusters are both the highest revenue bringing films ever made within their own category, high budget-Hollywood vs. low budget films.

Low budget and Hollywood movies are two different field to research. They do have different characteristics, the most important differerence is as we underlined in bold the huge budget difference. Science fiction genre movie is apparently a profit bringing and hence preferred genre among Hollywood movie producers. However the statement wouldn't be true or be applicable to low budget films which are shot under low budget, limited technological endowments. This fact wouldn't allow the indie film makers to make quality sci-fi space films with expensive costumes and film sets. In addition one wouldn't be able recommend low budget film makers to hire a super star in their movie in order to reduce the riskiness of a film and be a hit in box office revenues so done in Hollywood movies. From a different point of view, a movie starring a super star stared with a high salary also wouldn't be a low budget film after all. Briefly it is believed that the determinants of Hollywood movies and movies being shoot under $15million budget (low budget movies) having different characteristics. This study is a cased based study whose results will hopefully lead us to generalize the outcomes to the whole industry for sake of reducing the risk in the industry.

The motivation of this paper is to analyze the two samples and to analyze the similar patterns between which will help us to name the hints behind the financial success. In addition we will try to find an answer to the question how come ROI films with their limited-low budget capacity with no super star starred and with no marketing spending may gross extreme high revenue as Hollywood movies do with their high budget, big stars and large marketing spending. The question is whether or not "big budget" and its advantages (hiring a star) are crucial elements for a movie's financial success together with other determinants on box office revenue.

III. Literature review and Hypotheses development

Success is a relative criterion in movie industry it depends on the perspective. What success is called in movie industry? The revenue a movie received? The nominations and awards, the critical acclaim? In order to narrow our study this paper focused on the financial success however critical acclaim and award nomination of a movie is believed to be the determinants of a movie's financial success as well. Hence they will also be covered indirectly. Throughout the literature review by focusing on the determinants behind a movie's financial success, the expectations and hypothesis will be developed.

Financial Performance: The financial performance criteria changes often in each empirical research. While some of the researchers take the financial success of a movie in two years period of time, including the DVD sales, the copyright sales to TV and other revenues, some only looks at the box office revenue. Once the base of the study is built on the box office revenue the researchers usually focus on the first week or the second week revenue results since movies often collect %80 of their revenue within the first week. (Vogel, 1998) However I would like to open a parenthesis and to underline that movies mostly screened at cinemas for 2 weeks, unless they are extra ordinary movies such as Titanic, which stayed screened for 16 consecutive weekends. On the other hand, researchers may pick up the box office revenue numbers as domestic, international or worldwide box office revenue, based on their targets As it can be seen naming the concept, which in this case if the “financial success” , an important decision for results. For this reason, not surprisingly, in the literature different studies based on same sample, same methodology and model end up with different results.

Critical Review: The job of critics is to make critics of movies considering the films artistic silhouette. Critics can be done by either real authority, people known as critics or by audiences who already watched a movie and rate it through web sites. Critics influence audiences and, consequently, the box office performance of movies. However, this statement is contradictory. The researches done on the subject are clustered around two different outcomes that critical reviews have no effect on box office revenues while on the other hand it it is claimed to have significant effect. Critical evaluations appear to be valid effect on box office revenues in (Simonton, Dean Keit, 2002) study. Awad, Dellarocas and Zhang (2004) found in their study that online movie ratings have a positive impact on box office revenue of a film. They used internet

movie source IMDB for gathering data. They concluded also that online word of mouth has a significant and very important effect on consumers to watch a movie and hence has a direct effect on box office revenues.

(Basuroy, Chetterjee, and Ravid ; 2003) found in their paper that both negative reviews and positive reviews are correlated with box office performance. In addition of their contribution to the literature, they found that the negative reviews have a larger impact than positive reviews. Hence the effect of critic reviews on box office performance and consumer behavior is negative biased which means negative reviews hurt financial performance more than positive reviews contribution to box office performance. However they also found that the negative review effect can be moderated by star power effect and large budget effects.

Wallace, Seigerman, and Holbrook (1993) found that bad movies lose money with each positive review they receive while on the contrary blockbuster movies gain by each positive review. The interpretation given to this result is that it appears that a bad movie has something to gain by being as trashy as possible. Ravid on the contrary adds to the literature that the more reviews a film receive, positive or negative, the higher revenues it will obtain (Ravid, 1999).

Briefly there exists no clear result regarding the interrelations between critical acclaim-online reviews and a films financial success. One can understand that phenomenon and the result are really changing depending on selected samples and methodology used.

Movie Awards: There exist many award ceremonies to crown the artistic merit. The award categories of film are quite diversified i.e. best picture, best directing, screenplay (original and adapted), male and female lead acting, male and female supporting acting, film editing, cinematography, art direction, costume design, makeup, visual effects, sound editing, sound mixing, music. Considering award nomination, studies mainly interested in few type of award nominations which are usually best acting, directing, best picture and best screenplay award nominations. If a movie is crowned with one of these lead nominations it is believed that the movie signals high quality to a larger audience and encourages more people to see the movie, the nominations are indirect marketing canal which is believed to increase the box office revenue. The literature is full of studies with using award nomination as an explanatory variable to

understand movie profitability. The most well known award ceremonies are Oscar, Golden Globe, BAFTA, Cannes, Golden Bear, Sundance Film festival, Toronto Film festival.

Time of release : The most important and secure time to release a film is Christmas time (Litman, 1983) . However since all the movie makers aim to release their films around Christmas time or peak times, the competition rises during these seasons. Many films if they are not as strong as Hollywood movies in marketing terms in order to avoid the competition do not released in Christmas time. In addition, it is rarely seen that in Christmas time or any time of the year we see two blockbusters released at the same week. Movie industry is a well informed market, before the release of a movie the industry is publicly informed about the release time so others movies strategically behave. On the contrary some authors believe that the best time to release the film is summer season (Sochay, 1994) . Sochay adds that the peak time or season of the movie industry changes from year to year depending on competition and hence the strategically releasing times. The literature mainly gathers around the idea that during the peak holiday times of the year movies bring higher box office revenue.

MPAA (Motion Picture Association of America) : MPAA rates the movies according to films' thematic and content suitability for certain audiences. The primary MPAA ratings are **G** (General Audiences), **PG** (Parental Guidance Suggested/Some material might not be suitable for children), **PG-13** (Parents Strongly Cautioned/Some material may be inappropriate for children under the age of 13), **R** (Restricted/Under 17 not admitted without parent or adult guardian), and **NC-17** (No One 17 and Under Admitted) (Source: Wikipedia). Many film companies re-edit or re-shot their movies in order to increase their ratings to PG and PG-13 because these ratings exclude virtually no one from seeing the movies. Sawhney and Eliashberg (1996) found in their study that movies with restricted rating (R) bring lower box office revenue compare to the unrestricted ones. One the other hand, Litman (1999) in his study found no significant relationship between MPAA ratings and box office performance.

R is by far the most common rating, half of the movies within the whole industry is rated with R. It is followed by PG-13, G is the least frequent rating among films. (De Vany, Arthur; Walls, W, David 1999) NC-17 is extremely rare between Hollywood movies because it restricts the movie

to be seen by people under age 17. What is more he most common genre is drama followed by comedy which is usually rated with PG-13 and R according to the aforementioned study. On the other hand, the only genre which has been found significant regarding the box office revenue is the science fiction genre in Litman's study (Litman, 1983) while thriller has been found the most popular genre and romance is the least popular genre found in Neelamegham and Chinatagunta's study (Neelamegham and Chinatagunta, 1999). Briefly as in all the variables we have Genre and MPAA ratings and their significance are also quite controversial in literature.

Analst in his study found that movies which include erotic scenes and violence in it attracts more audiences Anast (1967).

On the other hand statistically speaking the table has been taken from www.the-numbers.com from where we also took the budget and box office revenue data of our case studies. All the movies shot between 1995 and 2012 can be seen on the table which are grouped according to their MPPA rating. Accordingly, the majority of the movies are PG-13 rated which is followed by R (restricted) rated movies. It is evident that the highest average revenue gross ($42,384,195) is realized by PG-13 rated films which is followed by R rated films ($15,337,934). Because of this evidence that PG-13 and R rated films bring higher average gross, most of the films by movie makers are tried to be fit in PG-13 and R rated category.

TABLE I: Top-Grossing MPAA Ratings 1995 to 2012

	Movies	Total Gross	Average Gross	Market Share
1 PG-13	2,028	$85,955,147,762	$42,384,195	45.08%
2 R	3,575	$54,833,115,390	$15,337,934	28.76%
3 PG	986	$36,830,727,925	$37,353,679	19.32%
4 G	276	$10,634,593,071	$38,531,134	5.58%
5 Not Rated	2,279	$1,760,744,156	$772,595	0.92%
6 NC-17	21	$72,872,987	$3,470,142	0.04%
7 Open	5	$7,678,311	$1,535,662	0.00%

Source: www.the-number.com

Star Power: Star power evaluation changes according to researchers. Some researchers evaluate an actor or director as a star according to the received academy awards or nominations whether or not the actor/director was in a top grossing movie previously. In our study while criticizing and evaluating the movies we will acknowledge an actor, actress or a director as a star according to this criteria, happened to be in high grossing movie before, being a real name with the fans.

The relationship between the box office revenue and the star power is a controversial issue. Can studios depend on a star's track record as a predictor of future success? Are two "A-list" stars better than one? The power of the star may spring from the superior acting skills or from a loyal fan club. Once an actor is known with its superior skill of acting and has reputation with accepting the good productions accordingly, this signals to the audiences that the movie must be worth to see. According to the study of De Vany (2007) Only 19 stars have a positive correlation with the probability that a movie will be a hit, no star is “bankable”. Albert (1999) in his study proves that, super stars are least noisy and the most consistent marker for successful films. Hence according to Albert’s study there exists a positive relationship between star power and box office success.

Large budget and star presence can create fails since it is not certain that movies will make profit or bring high revenue. On the other hand much smaller budgets and lack of star presence still do not prevent a film becoming a box office hit like Home Alone. (De Vany, Arthur; Walls, W, David 1999). The film El mariachi made a revenue which is 272 times of its budget . The movie included no super star and filmed only with $7000 budget.

De Vany in his study studied certain stars whether or not if they have significant effect on the box office revenue. He found that some stars have significant effect on box office however they have also have a high standard variance which means their power changes from movie to movie and not definite like Sandra Bullock, Michelle Phiffer, Jodie Foster. Tom Cruise had a very small standard deviation so he has a big effect on movie revenues definitely more power than stars like Tom Hanks. However he underlines in his study that none of the stars has a certain effect on the outcome. The only certainty is the variance because the variance is infinitive(De Vany, Arthur; Walls, W, David 1999) Briefly star power is a controversial issue in the literature.

Language and culture: English language is the world language for this reason it is not surprising that art and cinema is dominated by English language. There is an accumulation in literature, in art and in cinema in English language. Since English is the common used language by far compare to the other languages people tend to make their films in English language or partly in English in order to draw more audiences. The US cinema and its profit is based on foreign markets. It's domestic revenue is a small share of the total revenue. On the contrary French , German, Korean or Japanese cinema or any other country's cinema except than UK and the US depends on the domestic revenue. %90 of their revenue is gathered from the domestic market, even if they heavily focus on marketing as the US cinema does, because of the language barrier, the dubbing and the sub-titling these movies are not the first preference of the audiences since people feel alienated to films and find it hard to focus on the film with subtitle. To sum up since European cinema market usually ends up with their own market and domestic revenue rather than international big revenues as the US film industry does. Considering the English language skewed world, it is expected that English speaking films seen by wider audiences hence earn more revenue than European films. The movies which grossed the highest ROI ever, in addition the highest revenue earner big budget movies, they are all American movies, only this result talks for itself. Yet it is believed to be very important this determinant will not be included in our model, however the effect of the language is a good research topic for itself for further studies.

The Word of Mouth: Word of Mouth advertising is an unpaid form of promotion - oral or written- in which satisfied customers tell other people how much they like a business, product, service, or event (source: Wikipedia). The world of mouth is an independent source which is very crucial for the success of a movie however it is not very easy to get information of. Independent sources of information can’t be directly managed by film makers and marketers. Litman 1983, De Vany and Lee 2001 mention in their study that the word of mouth is a very crucial for film's success. However in our study we will not be focusing on this variable.

Genre: Genre is category of artistic composition, as in music or literature, characterized by similarities in form, style, or subject matter.

The genres of films were categorized as below:

- Adventure
- Musical
- Action
- Romance
- Teen
- Romantic Comedy
- Biography
- Animation
- Comedy
- Crime
- Documentary
- Period / Drama
- Drama
- Horror
- Family
- Science Fiction
- Fantasy

Each nation depending on the culture and preferences of its citizen might have a different taste of movie genre in motion picture industry. “Some countries appeared to produce culturally distinctive versions of genres formats. In Italy for example locally produced comedies performed very well but could be described as sex comedies and are unlike comedies produced in other territories.” (Film Victoria)

Once it is looked at the statistic we see from the below table that Comedy is the most common genre between movies however it is not the highest grossing genre. The highest grossing genres in box office are Adventure ($73,319,913), action ($56,257,259), romantic comedy ($28,007,155) and horror. The least average grossing movie genre on the contrary is drama even though in quantity it is the most preferred one which is a contradiction to mall over.

TABLE II: Top-Grossing Genres of movies shot from 1995 to 2012

		Movies	Total Gross	Average Gross	Market Share
1	**Comedy**	1,751	$44,792,158,044	$25,580,901	23.48%
2	**Adventure**	521	$38,199,674,469	$73,319,913	20.03%
3	**Drama**	3,132	$33,621,012,632	$10,734,678	17.63%
4	**Action**	570	$32,066,637,809	$56,257,259	16.81%
5	**Thriller/Suspense**	561	$15,495,734,985	$27,621,631	8.12%
6	**Romantic Comedy**	403	$11,286,883,357	$28,007,155	5.92%
7	**Horror**	329	$9,093,205,812	$27,638,923	4.77%
8	**Documentary**	1,076	$2,063,950,710	$1,918,170	1.08%
9	**Musical**	113	$1,865,013,970	$16,504,548	0.98%
10	**Black Comedy**	85	$781,440,299	$9,193,415	0.41%
11	**Western**	36	$685,432,870	$19,039,802	0.36%
12	**Concert/Performance**	41	$293,960,413	$7,169,766	0.15%
13	**Multiple Genres**	20	$8,280,303	$414,015	0.00%
14	**Genre Unknown**	5	$1,685,983	$337,197	0.00%

Source: www.the-numbers.com

Budget : Big budget movies with their high profile movie stars, expensive sets and special effects plus with large advertising budgets have an obvious advantage on drawing the crowd to box office (Terry,N., Butler, M.,De'Armond,D., 2005). In addition, Litman argues in his study that big budgets reflect higher quality and greater box office popularity (Litman, 1983)

Last but not least, Ravid and Basuroy's addition to the literature: big budget serves as an insurance policy for audiences that the film is good quality and worth to see (Ravid and Basuroy , 2003)

A different point of view added to the literature regarding the effect of budget on movie box office revenue comes from De Vany, according to his study big budget and star power lessen the effect of negative reviews and work as an insurance. Since success is difficult to predict in the film industry, film studios see large budget movies safer because even if the artistic quality of film is

bad, budget and star attracts audiences which secure some of the revenue (De Vany and Walls 1999) . In conclusion regarding the budget and its effect on box office revenue there is a general positive agreement in the literature.

Marketing Spending: Once the shooting and editing of a movie has been done, it doesn't mean that the movie has been completed. Marketing is an extra ordinarily crucial phase for box office revenue. Hollywood movies are high budget movies and in order to receive their investment back they need to reach to a high amount of audiences both in domestic and in external market. However marketing is very costly for Hollywood movies. The marketing costs around half of the original budget. For example Disney's flop movie, John Carter, cost $250million to make and another $100million cost to market it. (the-numbers). We believe that this determinant is a very important element in box office revenues, however it will not be included into our model within this study since it is a very broad subject needs a whole dedicated study only for itself.

Sequel: It is a well known fact that Hollywood loves sequels because it is safe to milk a film which had been hit before since it already has its own fans and followers. Especially for blockbuster movies with extremely high budget , production companies definitely want to make some profit together with collecting their investment.(Litman, 1983) Hence these production companies are less risk averse and prefer to make a movie out of a story or book which were successful on being a hit before. Some of the well known Hollywood sequels are The James Bond, Pink Panther, Star Trek , Nightmare On Elm Street, Harry Potter ,Batman , Spiderman, American Pie, Star Wars, Rocky, Terminator, Saw, Ice Age, The lord of the rings, The Pirates of the Caribbean, The Mummy, X-men, Hannibal, Aliens, Twilight, Shrek, The matrix, Toy Story and many more.

During Literature review we went through different perspectives and outcomes on the determinants of box office revenue. In the following section we will deepen the literature review in a case based study and will analyze our two samples, make a comparison between ROI- low

budget films and Hollywood-high budget films to see if they follow the same patterns in terms of the characteristics of the determinants of the box office revenue and to finally deduce our conclusion.

IV. Case Specific Study

This study includes 60 observations in total and only some very distinctive movies both from ROI sample and Hollywood sample will be reflected in their identity and own story. Whole movie names both in ROI and Hollywood sample can be found in the appendix.

IV.I) ROI Sample

El Mariachi : The Movie El Mariachi was produced with a budget of 7000 dollars, also known as the 7000 dollar movie. The movie is found shallow by critics. The story is repetitive throughout the film hence it is not a critically acclaimed movie. However the praise and positive critics of the film mainly stem from shooting an action film which is technically demanding and expensive but completed at a very low budget. It is one of the most inspirational films ever made in the film industry which proves to make a good movie big budget is not a "must". In this sense the film has been highly praised by critics and the leader directors in the sector. In addition the film is crowned with several international awards. The genre of the film is action movie with an MPAA rating R which restricts the range of audiences however still a large range of audiences have seen the movie. The actors or the director had no previous awards or nomination; they were all basically no-name. It was not a sequel but after its success it became a trilogy. The releasing date of the movie was neither on Christmas vacation nor during summer. The distributor of the film is Columbia Pictures. Hence it can be concluded that the distribution and the advertisement of the film have been done quite intensely compare to independent movies. Also since movie is the first of its kind, making a movie out of only 7000 dollar budget, draw massive attention and worked great as word of mouth publicity. The world gross revenue of the film has reached to $2,041,928. The rate of return on 7000 dollar investment was huge for a movie includes no stars, not released on a preferred time of the year, had no large budget, and rated with R. First of all, keeping the budget extremely low was a good trick within this film it

draw all the attentions to the movie, the story was well written and the style of the movie was more Hollywood style than an indie movie, but only with a slight difference with an extreme low budget which made it a big success and made movie makers and audiences watch the movie. Hence the movie took its place in the history as being $7000 movie and with one of the top highest ROI film ever made.

The Blair Witch Project: The Blair Witch project had a relatively higher amount of budget between indie movies with $600.000 budget and its worldwide revenue went incredibly high in proportion to its budget and reached to $248,300,000, the return is 413 times its production budget. The movie had been filmed in an indie movie style but grossed equal to a Hollywood movie. The genre of the film is horror hence the MPAA rating is R which restrict who can see the movie. However overall it did a good success. In the literature another phenomena which mustn't be forgotten horror movies draw high attention and bring good satisfactory box office revenues. The DVD sales of horror movies are quite high. The releasing date of the film corresponds with summer July 14th, 1999. Together with the genre "horror movie", the release date also helps us to explain the reason of the high gross of the film even though the director and the actors were no-name. Blair Witch Project is one of the most notable examples of trans-media success. What is a transmedia product? The movie Blair Witch Project started with real life rumors that two students got lost in the forest mysteriously, then had its own official web site, followers, book and later the story filmed. Until the movie has been shot the case" Blair witch" already got some followers and fans which also helps us to explain the films financial success.

Paranormal Activity: The movie was shot in 1999 by no-name student directors and actors. The genre of the movie is horror which was irected with a very small amount of budget rated with R in MPAA ratings. The film was made out of $15000. Paranormal activity is a mockumentary so is Blair Witch. The story is surrounded around a young couple who set up a video camera in an attempt to discover what exactly is going out in the night in their house. There is no monster, virtually no blood yet there exist long moments of silence. Even though the film sounds and feels very homemade, it's found one of the scariest films ever made. It's DVD sales is very high and it is very much liked among horror movie lovers which helped film to gross higher in box office revenues.

The common elements between highest revenue earner 30 ROI film are a catchy story (screen play-script), most of them being R rated, genre is mostly Horror, they all have low budgets, staring mostly no star, the directors are no-name. The marketing is usually an ignored element, yet the word of mouth is the key factor behind the success and wide audience. Also least but not least the screen play of all ROI films is mostly original not depending on a previous public event, a bestselling novel, a remake, sequel etc. A film needs to a story to be filmed. The story is sometimes an original idea, sometimes an adaptation of the book, a video game real life event. The adaptation of a bestselling novel is quite costly because firstly one needs to pay for the rights to a bestselling book which changes from $500.000 to 2 million. (Morris, Ben; Business Reporter). This large expense makes independent movie producers to stay away from hit novels since it is costly. However we will see that the Hollywood sample is the opposite of ROI films in originality.

IV.II) Hollywood Sample

Titanic : Titanic is a film based on a real, historical, teenager love story. It holds the second highest GROSS revenue (not rate of return on investment (ROI)) of all time ever. The strong aspects of Titanic were its mesmerizing music which became the highest selling movie theme ever. The director James Cameron who made films like Terminator, Alien an award winning director and Leonardo Di Caprio the protagonist in Titanic previously played in Romeo & Juliet , and Kate Winslet were already name before Titanic movie was shot. The budget of the films was $200.000.000. The releasing time of the movie was 19th of December 1997, just before the Christmas time. Titanic holds the record for second most total weekends at top of charts run, 15 weeks, the highest was ET with 16 weeks again a movie of James Cameron the same director with Titanic. The movie's MPAA rating is PG-13 for disaster related peril and violence, nudity, sensuality and brief language. The genre of the film is drama/romance. The story of the film originates from a true, historical story which is known to people. The movie was nominated to Oscar in 11 categories and won the best picture award. The movie's worldwide gross revenue is $2,185,672,302. Hence the movie had all the success elements in it, to be successful; the star, the releasing time, the high budget, appropriate MPAA rating, award nomination, marketing.

Avatar : A movie with an original and unfamiliar story in vanishing DVD market, Avatar would be either a blast or loss. However as mainly expected it brought a great success together with it. The heavy advertising behind as well as James Cameron's credit and a new technique 3D grasped the attention of audiences and the movie ended up with being highest revenue earning film ever made even passing Titanic, James Cameron's previous film. The movie, not to risk, has been released during Christmas time. The budget of the movie $425,000,000 and the world gross revenue is $2,783,918,982. The genre of the movie is science fiction and the MPAA rating is PG-13 for intense epic battle sequences and warfare, sensuality, language and some smoking. The movie has been nominated to Oscar awards in several categories. In conclusion, the movie had all the expected elements in it to bring success in revenue, expect the original story which is always found riskier compare to sequels and no staring a super star in the movie except than director's himself, James Cameroon.

V. Methodology, The model, Descriptive Statistics

The model

Log BoxRevenue = B0 + B1 Log Budget + B2AwardNom + B3Star + B4ReleaseDate + B5Story + B6FamousSoundTrack + B7G + B8PG + B9PG-13 + B10R + B11NC17 + B12Ratings

Dependent and Independent variables

Box Office revenue and Budget: The box office revenue and budget of each movie collected from the numbers site. The box office revenue is the worldwide gross in dollar currency. We want to know the effect of different variables on worldwide box-office revenue. Therefore, box-office revenue would be our dependent variable. Whereas Budget and 11 dummy variables which are stated below would be our independent variables.

The 11 dummy variables used in our model: award nomination, Star, release date, story, Famous sound track, G, PG, PG-13, R, NC17 and ratings.

Award nomination is a dummy variable is ranged from 1 to 5 according to the specificity of the movie within the sample. The Award nomination information of each movie has been collected

from IMDB site. There exists many awards giving institute. However our main focus in award nominations is attributed to some distinguished awards such as Oscar (Academy), Bafta, Golden Globe and Cannes nominations. In addition, the category of nomination is important, the nomination categories that we focus on are: best picture, best directing, best screenplay, male and female lead acting and for specific cases which are explained below, we didn't discard the side nominations such as best visual effect, sound, costume, make-up, sound-mixing etc.

Within this study in order to stay away from the personal tastes and preferences which would bias the results of the regression first all the nominations that movies received within the sample has been written down regardless looking at the movie name, each movie has been numbered between 1-5. The table given below is given as a sample this table has been done for all 60 movies in the sample (ROI: 30films - Hollywood: 30films) . The number =1, =2, =3,=4,=5 are the attributed number to each movie by looking at their nominations regardless than the movie name)

*****The Methodology of "Award nom" variable*****

Paranormal activity	No nominations in Oscar, Bafta, Cannes not even in side categories **= 1**
El mariachi	No nominations in Oscar, Bafta, Cannes not even in side categories **= 1**
Mad Max	No nominations in Oscar, Bafta, Cannes not even in side categories **= 1**
Theblair witch	Cannes Nom Several MTV nom **= 2**
The night of the living dead	No nominations in Oscar, Bafta, Cannes not even in side categories **= 1**
Rocky	10 Oscar nom: In the main categories (best director, best movie, best actor etc) **= 5**
Halloween	No nominations in Oscar, Bafta, Cannes not even in side categories **= 1**

American graffiti	5 Oscar nom: In the main categories. **= 5**
Clerks	2 Cannes nom **= 2**
Napeleon dynamite	No nominations in Oscar, Bafta, Cannes not even in side categories **= 1**
Saw	No nominations in Oscar, Bafta, Cannes not even in side categories **= 1**
Jaws	4 Oscar nom: 1 best picture , 3 side nom (in editing categories etc) 4 Bafta nom: Best actor etc **= 4**
Home alone	2 Oscar nom: Best music **= 3**
Mybig fat greek wedding	1 Oscar nom: Best writing, script **= 3**
Grease	1 Oscar nom: Best music + 4 golden globe nomination in the main categories **= 3**

*****To sum up:**

1 is given to the movies such as Paranormal activity, El mariachi, Twilight, 2012 which had no nomination at all in any of Oscar, Bafta, Cannes, Golden Globe; not even in side categories i.e. visual effect, sound design, make up.

2 is given to the movies i.e. Harry Potter sequels, Spiderman, The dark knight rises, Clerks, The Blair Witch project. The common point of these movies is none of them awarded for any awards in Oscar neither in main categories nor in side categories. However they are nominated in ONE or maximum two categories in Bafta, Cannes film festival, Golden Globe hence they are distinguished from movies which received 1.

3 is given to the movies which had 1 or several Oscar nominations however only in side categories (make up, sound mixing, art direction etc), plus some Bafta nominations.

4 is given to the movies which are nominated to Oscar in several categories in which one of them is from the main categories i.e. best picture, best animated movie of the year etc together with some side nominations. However these kind of movies even though they are very successful, are still one level lower than movies like Titanic, Star wars, Avatar which are nominated in more than

5 categories in Oscar in which categories included almost all the main categories i.e. the best picture, the best actor, the best story etc. Animated movies which are nominated for the best animation film of the year which is the most superiors' nomination an animation film can receive, plus nominated to few side nominations received 4 as well.

5 is given to the movies like Avatar, Titanic, The full Monty, The Lord of the rings, American Beauty, Rocky, American Beauty, Star Wars etc which are nominated from 10, 11 different categories including most of the main categories.

We have two different samples: First sample, 30 ROI films which are usually independent and low budget films with budget under $15 billion and the second one is 30 Hollywood highest worldwide revenue earner movies which have high budget.

ROI movie sample – summary statistics of "award nomin" variable

13 *movies are attributed with 1*

1 *movie is attributed with 2*

4 *movies are attributed with 3*

1 *movie is attributed with 4*

11 *movies are attributed with 5*

From STATA summary statistics below the <u>mean</u> value of the AWARDNOMINATION variable of the ROI sample is 2.87

Variable	Obs	Mean	Std. Dev.	Min	Max
borevenue	30	2.34e+08	2.10e+08	575486	7.93e+08
budget	30	4765733	5228839	7000	1.50e+07
awardnomin~n	30	2.866667	1.833281	1	5
star	30	.2	.4068381	0	1
releasedate	30	.3	.4660916	0	1
story	30	.2	.4068381	0	1
famousst	30	.2666667	.4497764	0	1
horror	30	.2	.4068381	0	1
family	30	.1	.3051286	0	1
animation	30	0	0	0	0
comedy	30	.2	.4068381	0	1
musical	30	.0333333	.1825742	0	1
thriller	30	.1	.3051286	0	1
action	30	.0666667	.2537081	0	1
scifi	30	0	0	0	0
drama	30	.2333333	.4301831	0	1
fantasy	30	.0333333	.1825742	0	1
g	30	.0666667	.2537081	0	1
pg	30	.3	.4660916	0	1
pg13	30	.0333333	.1825742	0	1
r	30	.5666667	.5040069	0	1
nc17	30	.0333333	.1825742	0	1
ratings	30	7.54	.8564562	5.8	9.2

Hollywood movie sample – descriptive and summary statistics of "awardnomin" variable

3 *movies are attributed with 1*

4 *movies are attributed with 2*

14 *movies are attributed with 3*

1 *movie is attributed with 4*

8 *movies are attributed with 5*

From STATA summary statistics the mean value of the AWARDNOMINATION variable of Hollywood sample below is 3.23

Variable	Obs	Mean	Std. Dev.	Min	Max
borevenue	30	1.02e+09	4.02e+08	4.60e+08	2.78e+09
budget	30	1.42e+08	5.88e+07	6.30e+07	2.58e+08
awardnomin~n	30	3.233333	1.278019	1	5
star	30	.8	.4068381	0	1
releasedate	30	.5666667	.5040069	0	1
story	30	.7333333	.4497764	0	1
famousst	30	.3666667	.4901325	0	1
horror	30	0	0	0	0
family	30	0	0	0	0
animation	30	.1666667	.379049	0	1
comedy	30	0	0	0	0
musical	30	0	0	0	0
thriller	30	0	0	0	0
action	30	.1666667	.379049	0	1
scifi	30	.1333333	.3457459	0	1
drama	30	.0333333	.1825742	0	1
fantasy	30	.4666667	.5074163	0	1
g	30	.1	.3051286	0	1
pg	30	.2	.4068381	0	1
pg13	30	.6333333	.4901325	0	1
r	30	.0333333	.1825742	0	1
nc17	28	0	0	0	0
ratings	30	7.576667	1.028116	4.8	9

By comparing the two samples average award nomination scores deduced from STATA summary table, the ROI-low budget film's average award nomination is 2.87 which lower than Hollywood-big budget-big revenue movies average 3.23. The prospective reason behind is that, since ROI films are low budget films , not much money spend on music, visual effects, advance sound designing or art direction which directly narrows their prospective nomination varieties and decrease the number of nominations.

Once again the expected coefficient sign from the variable "AWARDNOMINATION" after the stata regression is positive since it is believed that the award nomination signal audiences that the movie is a good which encourages more people to see the movie and increases the box office revenue.

Star: The star information of each movie has been gathered from IMBD . The variable has taken the value of 1 if the movie includes a top star within the movie with a large fan followers i.e.: Leonardo Di Caprio, Anthony Hopkins, Meryl Streep etc, plus a top named director who is previously known with hit movies James Cameron, Quentin Tarantino, Steven Spilberg etc. Either

a movie includes 5 "super stars" in a movie or only 1, the movie will receive 1. Hence a movie may receive only 1 and values. The expected sign of this variable is positive. If a movie is staring a real star either as an actor/actress or director , the fan and follower population of this name increases the box office revenues.

In top ROI-low budget- extreme high return sample, we have 6 movies starring a super star out of 30 movies(see the sample tables in the appendix).On the contrary in Hollywood-high budget-extreme high return sample, we have 24 movies out of 30 which star a super star. It is not surprising that Top Hollywood grossing movies have more super star than ROI films. Staring super star is an expensive ingredient for a film which is not affordable for ROI films. On the contrary risk averse high budget Hollywood films can, plus they love doing so since staring a super star is safer for sake of the high revenue of the film.

Release date: Going to cinema is a free time activity. For this reason Hollywood, blockbuster movies are usually released either during Christmas time or summer time since the box office revenue is expected to be higher during holiday times. Including these beliefs the expected sign of this variable is positive. In our model release date is a categorical variable which takes the value of 1 if the releasing time of a certain movie is during summer months or during Christmas times and takes 0 if contrary.

In the ROI movie sample we have 9 movies out of 30 movies released either during summer or Christmas time whereas in Hollywood film sample we have 17 movies released in summer or Christmas time. Since Hollywood movie have very huge budgets spent, they are less risk averse and try to maximize the circumstances in which the game will end with high revenue. Another reason is Hollywood movies usually, one year ago before the releasing of the movie, signals and publish their releasing date especially if it is on a vacation week (Christmas, Easter week etc) for this reason small budget ROI films even other Hollywood movies being released around the same time changes their releasing date. Since Hollywood movies have powerful producers and studios behind them they reserves these special weeks of the year. Small budget movies since they usually have less chance of demand preference compare to Hollywood blockbuster they avoid releasing their films at the same time with a Hollywood movie, hence small budget movies tend not to release the film on Christmas time or summer time which are long time ago reserved by Hollywood films. However still our expected sign of the variable is positive, a film either ROI or

Hollywood is expected to increase the movie's revenue if the releasing time is during summer or Christmas time since people are free to realize some free time activity.

Story (Sequel or not): The source of movies has been found from IMDB and Wikipedia searching. This variable is a categorical variable numerated with 0 and 1. Under this variable we will call a movie sequel if the story element of the movie or the movie itself is a transmedia product, a remake, reboot depending on a hit book, TV series, a short film, a well-known true life event. The belief is if a movie is a sequel the story or the film or the theme of the movie is already known it has its own followers who are familiar with the theme. Hence making sequels is a safe element for film makers for the revenue. Thus, Hollywood movie makers and film studios love sequels , the return of their investment is safer in belief .Following the idea we numerated movies which are sequel with 1 as they are believe to be more advantageous in creating higher box office revenue. The expected sign of this variable is expected to be positive.

While in our 30 top grossing ROI sample there exist only 6 sequels, in our top grossing 30 Hollywood movie samples there exist 23 sequels. It is clear that Hollywood loves sequels, remakes, to shoot known stories as it is believed in literature. Hollywood movie production is like a commercial activity rather than art creating once a movie becomes hit Hollywood loves the milk the whole profit in it. On the contrary ROI-low budget films are more risk takers. A little inspiration an original idea, the idea of making an original art film is more appreciated considering the small budget, risk is easier to take, originality is more underlined rather than repetitiveness in Hollywood.

Soundtrack: In the literature scanning there is no study on the contribution of a soundtrack in the success of a movie. Our hypothesis is soundtrack has no effect on bad quality movies, if a movie is bad quality in many aspects a tremendous soundtrack wouldn't help it to attract more audiences. However, once a movie has a certain quality and acclaimed by critics, the soundtrack of the movie makes the film unforgettable and help to the word of mouth. If it is looked at from another perspective, just a good soundtrack is another element of art, it is music, can be heard in anywhere independently from the movie. To us it serves as an indirect marketing channel bring extra audiences and reminds the movie to a already seen viewer even after once the soundtrack is randomly heard, and since it keeps the movie's name longer in memories the word of mouth

effect stay longer and the film gets ageless. (Example, titanic, Amelie, brave heat, gladiator, requiem for a dream, price and prejudice, pulp fiction,)

In our first sample , ROI films we have only 8 movies with a catchy soundtrack and 11 movie with a famous soundtrack in Hollywood sample. The deduction is again because of their large budget Hollywood movies can hire some very well musicians to compose an original soundtrack for the movie (Hans Zimmer, Yiruma, Yann Tiersen etc)

The soundtrack information has been found from YouTube and online sources, forums. YouTube especially have been helpful in searching a soundtrack belong to a specific movie with it's popularity , the comments under the video and the number of listening and the number of "likes" a soundtrack received. However still the overall judgment, while numerating a specific movie based on its soundtrack popularity, might be a little subjective. The last judgment of whether or not the soundtrack is powerful, catchy, qualified is done personally after listening the whole movies soundtracks. However as a researcher I tried to stay as objective as possible during the judgment whether or not the soundtrack of a movie is unforgettable or not.

There is no literature which included the soundtrack as a variable into a model. However it is strongly believed in this research that a good soundtrack adds a lot to a good movie and definitely increases its revenue and make a movie more memorable and unforgettable. However it has no effect if a movie is bad quality. Depending on this idea my expected sign of this variable is positive and movies known with their soundtrack are numerated with 1 and 0 if contrary.

MPAA ratings: is a dummy variable with 5 sub categories which are G, PG, PG-13, R, NC-17. The information regarding the MPAA rating of each movie has been collected from the numbers and IMDB, for example a movie which is rated with G in IMBD receives 1 and all the other movies which are not G takes zero.

According to the descriptive statistics of the sample,

Among our ROI films we have **2** "**G**" rated movies; **9** "**PG**" rated movie; **1** "**PG-13**" rated movie; **17** "**R**" rated movies;**1** "**NC-17**" rated movie

Among Hollywood-large budget movies there exist **3** "**G**" rated movies; **6** "**PG**" rated movies; **19** "**PG-13**" rated movies; **1** "**R**" rated and **1** "**NC-17**" rated movie.

We see that within low budget movies rated with "R" are very popular in ROI sample, 17 movies. While on the contrary there exists only 1 "R" rated movie within the Hollywood sample. Another funny surprise is that the most popular film kind in Hollywood sample is PG-13 rated films, there exists 19 movies out of 30 rated with PG-13 on the contrary there is only 1 movie in ROI sample.

In the literature it is already a well accepted fact that low budget films either independent or not are abundant in R rated movies, which means movies include violence, nudity, horror movies with restricted audiences rather than G, PG or PG-13 rated general audience family movies.

On the other hand it is also an accepted fact in the literature that Hollywood with its security obsession tend to make movies for more general audiences rather than movies which are including some extreme elements and hence limiting the audience who sees the movie. For this reason it was very expected that R , NC-17 movie would be very few in Hollywood movies on the contrary the industry would be full of PG and PG-13 rated movies.

The expected signs of the dummy variables G, PG, PG-13, R, NC-17 are as follows. In ROI film sample, the "R" variable is expected to have a positive sign since it is the most preferred MPAA rating, I expect that it brings more revenue to ROI films. On the contrary I have no sign expectations regarding other MPAA ratings in ROI sample.

The expected signs in Hollywood film sample on the contrary are; It is expected PG, PG-13 and G rated films to gross a higher revenue hence to have a positive sign on the other hand I expect R and NC-17 rated films within Hollywood sample to be negative.

Ratings: The data has been collected from IMDB, online viewers ratings attributed to a certain movie. The mean ratings of ROI films in our sample is 7.54 with minimum rated film 5.8 and maximum value 9.2. Whereas Hollywood movie's mean rating is 7.58, with 4.8 minimum and 9 maximum. It shows us that the 30 top worldwide revenue grossing ROI films and the 30 top worldwide revenue grossing Hollywood films has almost the same average 7.54 and 7.58

considering the viewers ratings on IMBD. The crucial thing in rating is if ratings of a movie are high on IMBD, it increases the likelihood of being watched. People look at the ratings before watching the movie hence high ratings encourage people to see a movie while low ratings discourage.

The expected sign of this variable in the model is positive the higher the ratings are the higher screening of a movie and hence the higher the box office revenue.

VI. Regression and Results

VI.I. Roi Sample

Ln BoxRevenue = B0 + B1 Ln Budget + B2AwardNom + B3Star + B4ReleaseDate + B5Story + B6FamousSoundTrack + B7G + B8PG + B9PG-13 + B10R + B11NC17 + B12Ratings

We have 13 variables in our model; 1 dependent and 12 independent variables. The detail of each variable has been given in the previous sections. We have two samples; ROI sample with 30 observations and Hollywood sample with 30 observations. Since two samples are different in characters, both samples tested differently to compare the results of both regressions.

Correlation matrix

First of all since it is suspected to have multi collinearity between several X variables, such as between Budget and Star ; Budget and Famousst (Soundtrack), the correlation matrix is run.

	log_bu~t	log_bo~e	awardn~n	star	releas~e	story	famousst	g	pg	pg13	r	nc17
log_budget	1.0000											
log_boreve~e	0.8439	1.0000										
awardnomin~n	0.6209	0.4782	1.0000									
star	0.4334	0.3370	0.4993	1.0000								
releasedate	0.0658	0.1088	-0.1130	-0.3273	1.0000							
story	0.2761	0.2777	0.1295	0.3750	-0.1455	1.0000						
famousst	0.3142	0.2432	0.3792	0.6407	-0.2303	0.2638	1.0000					
g	0.1815	0.1743	0.3163	0.2004	-0.1750	0.5345	0.1410	1.0000				
pg	0.3381	0.3034	0.3309	0.0364	0.2063	-0.1455	0.0987	-0.1750	1.0000			
pg13	-0.4060	-0.5599	-0.1923	-0.0928	-0.1216	-0.0928	-0.1120	-0.0496	-0.1216	1.0000		
r	-0.2580	-0.1638	-0.3259	-0.0673	-0.0147	-0.0673	-0.0811	-0.3056	-0.7486	-0.2124	1.0000	
nc17	0.0029	-0.0048	-0.1923	-0.0928	-0.1216	-0.0928	-0.1120	-0.0496	-0.1216	-0.0345	-0.2124	1.0000
ratings	0.4388	0.2833	0.6690	0.5205	-0.4630	0.0752	0.4189	0.1619	0.0726	-0.1411	-0.1102	0.0353

Since the danger of multi collinearity exist once the correlation between two Xs is higher than 0.8 and 0.9 we no need to worry under the results of correlation matrix.

OLS Regression

Source	SS	df	MS
Model	70.4806397	11	6.40733088
Residual	19.8723479	18	1.10401933
Total	90.3529876	29	3.11562026

Number of obs	= 30
F(11, 18)	= 5.80
Prob > F	= 0.0005
R-squared	= 0.7801
Adj R-squared	= 0.6457
Root MSE	= 1.0507

borevenue_~g	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
budget_log	.559098	.127538	4.38	0.000	.2911507	.8270453
awardnomin~n	-.0052281	.1994475	-0.03	0.979	-.4242517	.4137954
star	.1206378	.7446089	0.16	0.873	-1.443728	1.685003
releasedate	-.0572811	.5436356	-0.11	0.917	-1.199417	1.084855
story	.1665101	.6535057	0.25	0.802	-1.206454	1.539475
famousst	-.0622925	.5763971	-0.11	0.915	-1.273258	1.148673
g	.210312	1.600622	0.13	0.897	-3.152469	3.573093
pg	.1956032	1.238519	0.16	0.876	-2.406429	2.797635
pg13	-2.484364	1.638904	-1.52	0.147	-5.927572	.9588446
r	.0469874	1.157681	0.04	0.968	-2.38521	2.479184
nc17	(dropped)					
ratings	-.2153171	.3889542	-0.55	0.587	-1.03248	.6018454
_cons	12.28818	3.336208	3.68	0.002	5.279069	19.2973

Prob>F of the model found 0.0005 < 0.05 , our model is significant. In addition the R2 is0,78, which means %78 of the variation in the independent variable ,borevenue (box office revenue), can be explained by our model. However when we look at our variables and their significancy, the p-values, it can be seen that there exist only 1 variable which is significant which is the Budget independent variable (budget_log) with p value (0.000) < 0.05 . We can trust to the significancy of its coefficient 0.559098. Since, our budget and boxoffice revenue variables are in log form (once the log of these variables are not taken all the coefficients even dummy variables became absurd with e+8 values) a 1 percent change in budget cause less than 1 percent , but positive ,change on box office revenue.

VI.II. Hollywood sample

log BoxRevenue = B0 + B1 Log Budget + B2AwardNom + B3Star + B4ReleaseDate + B5Story + B6FamousSoundTrack + B7G + B8PG + B9PG-13 + B10R + B11NC17 + B12Ratings

Correlations matrix

	log_bo~e	log_bu~t	awardn~n	star	releas~e	story	famousst	g	pg	pg13	r	nc17
log_boreve~e	1.0000											
log_budget	0.4778	1.0000										
awardnomin~n	0.4017	-0.0393	1.0000									
star	0.2715	0.0926	0.3892	1.0000								
releasedate	0.4467	0.0644	0.3763	0.0374	1.0000							
story	0.1165	0.2643	-0.1061	0.0550	-0.1132	1.0000						
famousst	-0.1471	-0.4066	0.2417	-0.1557	-0.0534	0.1414	1.0000					
g	-0.0163	-0.0914	0.2840	-0.1005	0.0910	-0.2921	-0.0172	1.0000				
pg	-0.0453	-0.1806	-0.2530	0.0606	-0.3864	0.3303	-0.0259	-0.1809	1.0000			
pg13	0.2504	0.2041	0.1226	-0.0636	0.4242	-0.0231	-0.0109	-0.4306	-0.6492	1.0000		
r	-0.4759	-0.3116	-0.0430	0.1005	-0.2067	-0.3043	0.2582	-0.0667	-0.1005	-0.2392	1.0000	
nc17	.	.	.	.	.	.	.	.	.	.	.	.
ratings	0.1301	-0.1763	0.6439	0.2881	0.5216	-0.1406	0.1050	0.2456	-0.3131	0.1205	0.2040	.

	ratings
ratings	1.0000

It can be seen that there is no danger of multicoolinearity between independent variables.

OLS regression

```
. regress log_borevenue log_budget awardnomination star releasedate story famousst g pg pg13 r nc17 ratings
```

Source	SS	df	MS
Model	1.65289198	11	.150262907
Residual	.90628098	16	.056642561
Total	2.55917296	27	.094784184

Number of obs = 28
F(11, 16) = 2.65
Prob > F = 0.0374
R-squared = 0.6459
Adj R-squared = 0.4024
Root MSE = .238

log_boreve~e	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_budget	.3576073	.1477792	2.42	0.028	.0443294	.6708852
awardnomin~n	.0669173	.0591249	1.13	0.274	-.0584219	.1922565
star	.1381013	.1405396	0.98	0.340	-.1598294	.436032
releasedate	.2188458	.1248718	1.75	0.099	-.0458705	.4835621
story	-.106529	.1358429	-0.78	0.444	-.394503	.1814451
famousst	.0866975	.1320481	0.66	0.521	-.1932319	.366627
g	.0803725	.3313362	0.24	0.811	-.6220288	.7827738
pg	.3011746	.2824149	1.07	0.302	-.2975183	.8998675
pg13	.146758	.2764363	0.53	0.603	-.4392606	.7327767
r	-.3426342	.4278185	-0.80	0.435	-1.249569	.5643005
nc17	(dropped)					
ratings	-.0353719	.0732945	-0.48	0.636	-.1907493	.1200054
_cons	13.73885	2.941717	4.67	0.000	7.502683	19.97501

Prob>F = 0.0374, the model has been found significant (<0.05). The changes in dependent variable %0.65 (R2) explained by our independent variables. Since the overall model is significant we can look at the siginificancy of coefficients of the variables. We only have 3 variables significant out of 13 variables. Which are log budget, with the p-value: 0.028 < 0.05 ; release date p-value 0.099 < 0.05 ; and constant with p value 0.000< 0.05 . The rest of the variables unfortunately have been found insignificant. The sign of budget and release date suits to our expectations, both are positive. A %1 change in budget brings %0.36, less than 1 percent

change, in worldwide box office revenue. Release date shows us that if a movie is released on Christmas time or summer it positively affect and increase the box office revenue by %22.

VII. Discussions

Our variables has been mostly found insignificant which is having a star in a movie, a famous soundtrack, or having and R rate in MPAA or PG-13 means nothing for the box office revenue neither for ROI low budget films nor for the Hollywood films. Hence there is no correlation between these variables and the box office revenue. Under these results paying a lot of money for staring a super star in a movie is not guaranteeing a large grossing in the box office revenue.

However I would like to draw the attentions to some points which might mistakening the results. Each sample has 30 variables in it and the model has 12 independent variables. It is a quite large amount of variables for a sample with 30 observation, the degrees of freedom n-k (30-12) is low . Also the genre variable which has 10 sub genre category is not added to the model since it increased the number of independent variables to 22 and diminished further the degrees of freedom to 8 . As a matter of fact, once for an experiment all the genre sub categories were added to the model as dummy variables none of the previously existing variables became significant whereas all the new added genre variables (drama, comedy, horror, musical etc) ended up with being significant, plus all with negative coefficients on the contrary to expectations, plus with very bizarre coefficiencies. Hence the genre variable after some trials has been excluded from the model. However it is still an important component and an omitted variable together with excluded language and marketing variables.

Within the next studies the study can be done much more interesting with enlarged sample size together with including variables such as genre, language and marketing spending.

VIII. Conclusion Remarks

The movie making is an uncertain business based on tastes with infinite variance. Past success does not precede future success. While many movies of star directors and star actors bring success to one specific movie the next movie can be a failure, the industry is full of it's examples. However all studies within this field aims to find a way to reduce the riskiness, the variance of industry.

In order to analyze the industry we focused on the 60 most financially successful movies ever shot, thirty of them belong to high budget-Hollywood movies while thirty of them belong to low budget-mostly independent movies. The motivation and aim of the study has been to compare these two successful clusters to see whether or not big budget is a 'must' for generating high box office revenue as well to assess the power of other determinants on determining the box office revenue.

Our case based comparison even only with descriptive statistics helped us a lot to see the different characteristics of ROI-independent films and Hollywood films. However all the differences actually stem from the budget difference, including a star to the film, the high marketing spending, to hire a top musician for a quality sound track arrangement, the preferred release dates being usually reserved by financially powerful Hollywood movies not by films within ROI sample, different genre and MPAA preferences of two the clusters, Hollywood movies being more risk averse considering their large investment hence targeting a wider audience range on the other hand considering the MPAA and genre ROI films being more risk taking and not to mind limiting the target audience.

However the evident and self talking descriptive data haven't been concluded with a truly valid regression results. Due to the small size of observation in each group together with thirteen variables in total hence the low level of degrees of freedom, the econometrical part of the study haven't been crowned with the expected results and significancy except the budget and the release date. The budget and the release date are the only variables within the regression are significant and with positive sign, accordingly high budget brings high box office success, and movies released during Christmas or summer time ends up with higher grossing revenues.

On the contrary of its flaws and the lack of a larger sample the study itself was very interesting especially for seeing not to underestimate the financial success of low-budget films, their ROI (rate of return to investment) usually end up higher than Hollywood movies do. The conclusion is quality movies do not only shoot with large budgets or under the wings of Hollywood film studios. Low budget films may always play the game to A+ league and compete with Hollywood movies, however with different elements than Hollywood film industry does, which means with their risk taking nature, experimental and original story lines.

IX. APPENDIX

SAMPLE I: ROI MOVIES (Low budget-high rate of return)

MovieName	borevenue	budget	awardnominstar	releasedate	story	famousst	g	pg	pg13	r	nc17	ratings	genre
Paranormal Activity	196681656	15000	1	0	1	0	0	0	0	0	1	0	6.4	Horror
Mad Max	99750000	200000	1	0	0	0	0	0	0	0	1	0	7	Action
The Blair Witch Project	248300000	600000	1	0	0	1	0	0	0	0	1	0	6.3	Horror
El Mariachi	2041928	7000	1	0	0	0	0	0	0	0	1	0	6.9	Action
The night of the living dead	30000000	114000	1	0	0	0	0	0	0	0	1	0	8	Horror
Rocky	225000000	1000000	5	0	0	0	1	0	1	0	0	0	8.1	Drama
Halloween	70000000	325000	1	0	0	0	0	0	0	0	1	0	7.9	Horror
American Graffiti	14000000	777000	5	0	1	0	0	0	1	0	0	0	7.5	Comedy,dran
Clerks	3894240	27000	2	0	0	0	0	0	0	0	1	0	7.8	Comedy
Once	18997174	150000	3	0	0	0	1	0	0	0	1	0	7.9	Drama
Napeleon Dynamite	46140956	400000	1	0	1	0	0	0	1	0	0	0	6.8	Comedy
Open Water	55116982	500000	1	0	1	0	0	0	0	0	1	0	5.8	Thriller
Friday the 13th	59754601	550000	1	0	0	0	0	0	0	0	1	0	6.4	Horror
Saw	103096345	1200000	1	0	0	0	0	0	0	0	0	1	7.7	Horror
Primer	575486	7000	1	0	0	0	0	0	0	1	0	0	6.9	Thriller
ET	792965326	10500000	5	0	1	0	0	0	1	0	0	0	7.9	family
The full monty	257938649	3500000	5	0	1	0	0	0	0	0	1	0	7.1	Comedy
Star Wars	775398007	11000000	5	1	0	0	1	0	1	0	0	0	8.8	Fantasy, actio
My big Fat Greek Wedding	352242522	5000000	3	0	1	0	0	0	1	0	0	0	6.5	Comedy
american beauty	356258047	15000000	5	1	0	0	0	0	0	0	1	0	8.5	Drama
home alone	476684675	15000000	3	0	0	0	0	0	1	0	0	0	7.3	family
slumdog millionaire	375802989	14000000	5	0	0	0	0	0	0	0	1	0	8.1	drama, roman
jaws	470700000	12000000	4	0	0	0	0	0	1	0	0	0	8.7	Thriller
american pie	234723148	12000000	1	0	1	0	1	0	0	0	1	0	7	comdey
the sound of music	286214286	8200000	5	1	0	1	1	1	0	0	0	0	7.9	family
pulp fiction	212928762	8000000	5	1	0	1	1	0	0	0	1	0	9	Drama
the god father	268500000	7000000	5	1	0	0	1	0	0	0	1	0	9.2	Drama
grease	387513770	6000000	3	1	0	1	1	0	1	0	0	0	7.1	musical
fahreneit 9/11	222414517	6000000	1	0	1	1	0	0	0	0	1	0	7.5	documentary
gone with he wind	390525192	3900000	5	0	0	1	0	1	0	0	0	0	8.2	Drama

SAMPLE II: HOLLYWOOD MOVIES (High budget-High Box office revenue)

Name of the movie	Borevenue	Budget	AwardNomi	Star	ReleaseDate	Story	Famousst	G	PG	PG13	R	NC17	Ratings	Genre
Avatar	2783918982	237000000	5	1	1	0	0	0	0	1	0		08	Fantasy
Titanic	1842879955	200000000	5	1	1	1	1	0	0	1	0		07.6	Drama
Harry Potter and deathly Hallows : Part II	1328111219	125000000	3	1	1	1	0	0	0	1	0		08.1	Fantasy
The Lord of the Rings: The Return of the King	1141408667	94000000	5	1	1	1	1	0	0	1	0		08.9	Fantasy
Jurassic Park	923863984	63000000	3	1	1	0	0	0	0	1	0		08	Sci-fi
The lion king	952880140	79300000	3	0	1	0	1	1	0	0	0		08.4	Animation
Shrek 2	919838758	70000000	4	1	0	1	1	0	1	0	0		07.3	Animation
Star Wars Ep:1 Phantom Menace	1006863310	115000000	3	1	0	1	1	0	1	0	0		06.5	Fantasy
The Lord of the Rings : Two towers	927048984	94000000	5	1	1	1	1	0	0	1	0		08.7	Fantasy
Transformers : Dark of the moon	1123745628	195000000	3	1	1	1	0	0	0	1	0		06.3	Sci fi
Harry Potter and the Sorcerer's Stone	974755371	125000000	3	1	0	1	0	0	1	0	0		07.3	Fantasy
Ice age : Dawn of the dinasours	886968695	90000000	1	0	1	1	0	0	1	0	0		07	Animation
Harry Potter and deathly Hallows : Part I	956399711	125000000	3	1	0	1	0	0	0	1	0		07.6	Fantasy
Finding Nemo	867894287	94000000	5	1	0	0	0	1	0	0	0		08.1	Animation
Harry Potter and Chamber of Secrets	878979634	100000000	2	1	0	1	0	0	1	0	0		07.2	Fantasy
Independence day	817400878	75000000	3	1	1	0	0	0	0	1	0		06.8	Sci fi
Toy Story 3	1064404880	200000000	5	1	1	1	0	1	0	0	0		08.5	Animation
The Lord of the Rings: The Fellowship of the Ring	869390266	109000000	5	0	1	1	1	0	0	1	0		08.8	Fantasy
the dark night rises	1079343943	250000000	2	1	1	1	0	0	0	1	0		08.6	Action
spider man 3	890875303	258000000	2	1	0	1	0	0	0	0	0		06.3	Fantasy
2012	766812167	200000000	1	0	0	0	0	0	0	1	0		05.8	Action
Alice in wonderland	1024391110	200000000	3	1	0	1	0	0	1	0	0		06.5	Fantasy
the dark knight	1002891358	185000000	3	1	1	1	0	0	0	1	0		09.0	Action
inception	832584416	160000000	5	1	1	0	0	0	0	1	0		08.8	Action
spiderman	821565375	139000000	3	0	0	1	0	0	0	1	0		07.3	Fantasy
twilight saga	709938657	127500000	1	0	0	1	1	0	0	1	0		04.8	Fantasy
the matrix	460279930	65000000	3	1	0	0	1	0	0	0	1		08.7	Sci-fi
starwars epidose III	848998877	115000000	3	1	0	1	1	0	0	1	0		07.7	Fantasy
Pirates of the Caribbean: Dead Man's Chest	1060615812	225000000	3	1	1	1	1	0	0	1	0		7.3	Action
Harry potter and the order of phoneix	942943935	150000000	2	1	1	1	0	0	0	1	0		7.4	Fantasy

X. BIBLIOGRAPHY

Gemser, G., M.A.M.ALeenders, and N. M. Wijnberg.(2008) Why Some Awards Are More Effective Signals Of Quality Than Others: A Study Of Movie Awards *Journal of Management* Vol. 34, No. 1

King, T. (2007). Does film criticism affect box office earnings? Evidence from movies released in the U.S. in 2003. *Journal of Cultural Economics*, *31*, 171-186.

Ravid, S. Abraham-Information, Blockbusters, and Stars: A Study of the Film Industry-Journal of Business, 1999, vol. 72, no. 4

Agostini, Claudio A., Saavedra, Eduardo H. (2009). The Effects of Vertical Integration on the Release of New Films, working paper

Terry, N. ,King,R.,Walker, Jeri J. (?)The Determinants of Box Office Revenue for Horror Movies

Redfern , N. Genre trends at the US box office, 1991 to 2010

Luo, Lan, Xinlei (Jack) Chen, J.H., C Whan Park (2010). Dilution andEnhancement of Celebrity BrandsThrough Sequential Movie Releases , *Journal of Marketing Research,* Vol. 47, No. 6.

Kaimann, D."To infinity and beyond!" - A genre-specific film analysis of movie success mechanisms* *University of Paderborn, Department of Business Administration and Economics*

Sochay, S. 1994: Predicting the Performance of Motion Pictures. J*ournal of Media Economics*, Vol. 7, No. 4, p. 1-20

Litman, B. R. 1983: Predicting Success of Theatrical Movies. An Empirical Study. In: Journal of Popular Culture, Vol. 16, No. 4, p. 159-175

De Vany, A.,Walls, W. D. (1999). Uncertainty in the Movies. Can Star Power reduce the Terror of the Box-Office? *Journal of Cultural Economics*, Vol. 23, No. 4, p. 285-318

Dreamworks animation, annual report 2010

De Vany, A. (2004) .How extreme Uncertainty shapes the film industry, *Reutlage*

Ji, S.W., Waterman,D. (2010) . Production Technology and Trends in Movie Content: An Empirical Study

Terry,N., Butler, M.,De'Armond,D. (2005) The determinants of domestic box office performance in the motion picture industry, *Southwestern Economic Review* 32: 137-148

Eliashberg, J. , S. M. Shugan (1997). Film Critics: Influencers or Predictors? *Journal of Marketing*, 61, 68-78.

Eliashberg,J., Elberse, A., Leenders M. (2006)The motion picture industry: critical issues in practice, current research, and new research directions, *Marketing Sceince* 25 (6): 638-661

Dellarocas,C., Farag, N.,Zhang, X. (2005) Using online ratings as a proxy of word-of-mouth in motion picture revenue forecasting, SSRN Working Paper

Collins,A.,Hand,C.(2006) Vote Clustering in Tournaments-What can Oscar tell us? *Creativity Research Journal,* Volume 18,Issue 4, 427-434

McLaren *, C.H.,* DePaolo *,C.A.* (2009) *Journal of Statistics Education* Volume 17, Number 1

Suominen, S., Critics review or preceding week's admissions explaining movie admissions *LTA 3 / 11* , p . 2 9 0 – 3 1 5

Dingenouts, S.(2012),A study on box-office revenue How user and expert ratings determine movie success, *Master Thesis Marketing, Erasmus University Rotterdam*

Deniz, B., Hasbrouck,Robert B. What determines box office success of a movie in the united states?

Velikovsky, J.T. (2013) Two Successful Transmedia Case Studies: *The Blair Witch Project* (1999) and *The Devil Inside* (2012), working paper

Sparrow, Ilana R.,Simonoff, Jeffrey S. (2000) Predicting movie grosses: Winners and losers, blockbusters and sleepers *Chance*, 13(3), 15-24

Krauss, J; Nann, S; Simon, D; Fischbach, K; and Gloor, Peter, 2008) .Predicting Movie Success and Academy Awards through Sentiment and Social Network Analysis *ECIS 2008 Proceedings.* Paper 116.

Rossiter, C. (2003) *The factors that drive success in motion picture development : an Australian context.* Masters thesis, Queensland University of Technology

Theatricial market statistics 2011, MPAA